PARAMETERIZATION OF THE NUCLEUS-NUCLEUS POTENTIAL

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1. The nuclear part of the nucleus-nucleus potential in paper [1], U, is parameterized as

\[ U(r) = \frac{-V_0}{1 + e^{(r-R_p-R_T)/a_v}}, \]

with the potential depth is

\[ V_0 = 16\pi\gamma a_v R_{TP}. \]

In these expressions the reduced radius is

\[ R_{TP} = \frac{R_T R_P}{R_T + R_P}, \]

with

\[ R_i = 1.20 A_i^{1/3} - 0.09 \ \text{fm}. \]

The diffuseness parameter is

\[ \frac{1}{a_v} = 1.17 \left[ 1 + 0.53 \ A_p^{1/3} + A_T^{4/3} \right] \ \text{fm}^{-1}, \]

while the surface tension parameter is

\[ \gamma = 0.95 \left[ 1 - 1.8 \frac{N_p - Z_p}{A_p} \frac{N_T - Z_T}{A_T} \right] \ \text{MeV} \cdot \text{fm}^{-2}. \]

2. The imaginary part of the nucleus-nucleus potential is not discussed in paper [1]. In the NRV the radius and diffuseness parameters of imaginary part \( R_W \) and \( a_W \) are suggested to be equal to the real part’s ones, while imaginary depth \( W_0 \) is a quarter of the real depth. This choice is arbitrary therefore these parameters should be fitted additionally.

3. The Coulomb potential radius is not defined in paper [1], so in the NRV it is equal to

\[ R_C = 1.30 \ A_p^{1/3} + A_T^{1/3} \ \text{fm}. \]

References: